laws of storms has suffered an exception, that the wind has on one occasion not blown perpendicularly to the direction of the centre, they will be tempted to cast aside the rules which have hitherto guided them. This would only be to sacrifice reality to an empty illusion, and science to error.

It is for this reason that we have insisted at some length on a prejudice which might result in consequences so deplorable. But half of our task is still before us. We have yet to point out the true theory of these phenomena, and to show how the sailing rules hitherto adopted are justified by it. In this way will these rules, thus cleared from empiricism, be invested with the authority which they at present stand in need of.

(*To be continued.*)

NOTES

THE following are some of the principal works in the various departments of science and in travel which are announced for publication during the present season. Messrs. Longman and Co. have the following in preparation:—"The Moon and the Condition and Configurations of its Surface," by Edmund Neison, F.R.A.S., illustrated with maps and plates. "An Epitome of the Geology of England and Wales," by Horace B. Woodward, F.G.S., Geologist on the Geological Survey of England and Wales; and a new volume of the "Text-Books of Science," "Telegraphy," by W. H. Preece, C.E., and J. Sivewright, M.A. "Shooting and Climbing in the Tyrol," with an account of the manners and customs of the Tyrolese, by W. A. B. Grohmann, with numerous illustrations from sketches by the author. "The Frosty Caucasus, an account of a walk through part of the Range and of an ascent of Elburz in the summer of 1874, by F. C. Grove, with map, and illustrations engraved on wood by E. Whymper, from photographs taken during the journey. "The Indian Alps and how we crossed them," being a narrative of two years' residence in the Eastern Himalayas, and two months' tour into the interior towards Kinchinjunga and Mount Everest, by a Lady Pioneer. This work will contain a large number of wood engravings and twelve full-page chromolithographs. "A Journey of a Thousand Miles through Egypt and Nubia to the Second Cataract of the Nile," being a personal narrative of four-and-a-half months' life in a Dahabeeyah on the Nile; with some account of the discovery and excavation of a rock-cut chamber or Speos at Aboo-Simbel; descriptions of the river, the ruins, and the desert, the people met, the places visited, the ways and manners of the natives, &c., by Amelia Edwards, author of "Untrodden Peaks and Unfrequented Valleys," &c. The work will also contain ground plans, facsimiles of inscriptions, a map of the Nile from Alexandria to Dongola, and about seventy illustrations engraved on wood from finished drawings executed on the spot by the author.—Messrs. Sampson Low and Co. have nearly ready for publication Mr. John Forrest's "Explorations in Australia." The work will include three different journeys, namely: (1) Expedition in search of Dr. Leichardt and his party; (2) A journey from Perth to Adelaide, around the Great Australian Bight; (3) From Champion Bay across the desert to the Telegraph and to Adelaide. The book will contain illustrations from the author's sketches. Messrs. Longman have also in the press the following:—A work by Dr. Arthur Leared, on "Morocco and the Moors," being an account of travels, with a general description of the country and its people, with illustrations. A new volume on Assyria, by Mr. George Smith, entitled "Assyrian Discoveries," containing the Chaldean accounts of the Creation, the temptation and fall of man, the Deluge, the Tower of Babel and Confusion of Tongues, Nimrod, &c. This book will be profusely illustrated. A translation of Herr Edouard Mohr's "Nach den Victoriafällen des Zambesi" (reviewed in NATURE, vol xii. p. 231), containing an account of the South African Diamond Fields, &c., is also promised; it will be accompanied by numerous full-page and other woodcut illustrations, several chromolithographs, and a map.—Messrs. Daldy, Isbister, and Co. have in the press a "Geology for Students and General Readers," embodying the most recent theories and discoveries, by A. H. Green, Professor of Geology and Mining in the Yorkshire College of Science. It will be divided into two parts, the first containing the elements of Physical Geology; and the second, the elements of Stratigraphical Geology. Each part will contain upwards of 100 illustrations by the author.—Messrs. Macmillan and Co. have in preparation for the ensuing season, "A Course of Practical Instruction in Elementary Biology," by Prof. Huxley, F.R.S., and H. N. Martin, B.A. "The Modern Telescope," by J. Norman Lockyer, F.R.S.; lectures delivered at the Royal Institution, with additions by G. M. Seabroke, F.R.A.S. This work will be copiously illustrated, and will be uniform with the author's "Solar Physics." Also a work on "Stethometry: Examination of the Chest by a new and more exact method;" with some of its results in physiology and practical medicine, by A. Ransome, M.D. The two following books of travel will also be published in the autumn by Messrs. Macmillan and Co.:—"The Two Expeditions to Western Yunnan, commanded by Major Sladen and Col. Horace Browne," by Dr. Anderson, Director of the Indian Museum, Calcutta, and Professor of Comparative Anatomy in the Medical College, Calcutta, with numerous maps and illustrations. "The Zoology and Geology of Persia," by W. T. Blanford, with narratives of travel by Majors Lovett, St. John, and Evan Smith, and an introduction by Sir Frederick Goldsmid. This work will contain coloured plates and maps, and will be issued in two octavo volumes.—Among Messrs. Smith, Elder, and Co.'s announcements of forthcoming books we notice the following which may be of interest to our readers:—"Science Byways," by Richard A. Procter; and "Notes on the Climate of the Earth, Past and Present," by Capt. R. A. Sergeaunt, Royal Engineers. This last work will be illustrated with diagrams.

THE Yorkshire College of Science at Leeds, which was informally opened a year ago, was formally "inaugurated" yesterday by the Duke of Devonshire and other eminent men. There was a luncheon in the Great Northern Hotel, and a public meeting in the evening, addressed by the Right Hon. Lyon Playfair and others. The first session of this College, it is said, was as successful as could be expected. We have already stated that we cannot regard this institution on its present basis as satisfactory. Except for students whose education up to a certain point has been complete, the curriculum of a science faculty by itself, however complete, may easily do more good than harm. What we want are not separate science colleges, but first-rate secondary schools in which science should find its proper place. When these secondary schools exist, then the students who have passed through them may benefit from a technical school in which no literature is taught—but not till then.

THE inaugural sitting of the International Geodesical Congress took place on the 20th September at the Ministry of Foreign Affairs, Paris, under the presidency of General Hanez, the delegate for Spain. No delegate was present for Great Britain or for the United States; the German Empire was represented by General de Bayer, the Russian Empire by General de Broch, the Austrian Empire by Dr. Oppolzer; Italy, Belgium, Roumania, Switzerland, and the several German States were also represented. M. Charles Jourdain, member of the French Institute, and general secretary of the Minister of Public Instruction, delivered a speech in the name of M. Wallon, who is travelling in the provinces. It was replied to by General Hanez and by Ge-

neral de Bayer. M. Faye spoke in the name of the French section, which had invited a number of eminent men of science to take part in the proceedings. A number of reports of the Permanent Section having been read, the assembly adjourned to the following day. On the following evening a number of the delegates visited the Observatory of Paris. It is stated that the longitude of Palermo and Lisbon will be determined electrically with the instruments which have been used for determining the longitudes of Vienna and Algiers.

A PAIR of Sea Lions are shortly expected at the Brighton Aquarium, from the coast of California. They most probably are specimens of Steller's Sea Lion (*Otaria stelleri*), or of Gillespie's Sea Lion (*O. japonica*), judging from the locality whence they were obtained. It must be remembered that the name Sea Lion corresponds with the genus scientifically known as *Otaria*, and that there are several species, two of which—*O. jubata* and *O. pusilla*, both from the Falkland Islands—are represented in the collection of the Zoological Society in Regent's Park. Further information with reference to these interesting animals, from some species of which the so-called sealskin of commerce is obtained, will be found in our abstracts of two lectures delivered in the Zoological Gardens by Mr. J. W. Clarke during the early summer of this year (NATURE, vol. xi. p. 514, and vol. xii. p. 8).

THE organisation of the French meteorological regions is progressing satisfactorily. The example was set by Montpellier for the southern Mediterranean region. The northern Mediterranean region has now been centralised at Marseilles, and will very shortly commence operations. A special Meteorological Congress will be held in Poitiers for the western and south-western regions. The date is not quite determined, but a day in the end of October will probably be chosen."

A NEW Physical Observatory is to be erected at Pawlowsk, in connection with the Imperial Russian Physical Observatory at St. Petersburg.

MR. W. B. HEMSLEY has been appointed librarian to the Lindley Library, at the rooms of the Royal Horticultural Society, South Kensington, in the place of Prof. Thiselton Dyer.

THE Astronomical School established at Montsouris under the authority of the French Bureau des Longitudes was opened on Monday morning at eight o'clock by Capt. Mouchez, the director, and Admiral Paris. The pupils are six in number, all of them being lieutenants in the national navy. The period of study is six months. Every two months two pupils will leave and be replaced by two other naval lieutenants. A number of sailors will be attached to the establishment. The students will be taught the practice of celestial photography, spectroscopy, meridian observations, &c.

WE noticed the establishment of a School of Anthropology as being in preparation in Paris some months ago. We are in a position now to give the complete list of professors and the subjects for the course of lectures :—Broca, anatomical anthropology ; Dally, ethnological anthropology ; De Mortillet, prehistoric anthropology ; Hovelaeque, linguistic anthropology ; Topinard, general anthropology ; Bertillon, statistical and geographical anthropology. MM. Broca, Dally, and Bertillon are connected with the press, and leading members of the Paris Anthropological Society ; M. de Mortillet is the Conservator of the Prehistoric Museum at St. Germains.

A MERIDIAN-ROOM, intended for the observations of the French Bureau des Longitudes, was opened last Saturday by M. Dumesnil. The Bureau is now an independent establishment, having an office for meetings of members and computers in a pavilion belonging to the National Institute.

IT is proposed to hold an Electrical Exhibition in Paris in 1877. It will be held in the Palais de l'Industrie, the object being to illustrate all the applications of electricity to the arts, to industry, and to domestic purposes. This project, which was initiated by Count Hallez d'Arros, has been received with general favour both by the scientific and industrial worlds, and the necessary funds have been already guaranteed. An organising committee is being formed, and the provisional offices of the Exhibition have been established at 86, Rue de la Victoire.

THERE has been recently published in Russia a work by MM. Mendeléef and Kirpetschoff, on the Compressibility of Gases. The authors have been led to several results which ought to attract the attention of physicists ; they tend, in fact, to prove that Mariotte's Law does not hold good at low pressures, and that some of the results of Regnault's experiments do not agree with those obtained in other conditions.

THE Swedish Arctic Exhibition arrived at Hammerfest on Sept. 26, in perfect health and condition. They have brought back a rich naturalist collection and several important hydrographic reports. The mouth of the Jenisei river was reached on the 15th of August, and Professors Nordenskjöld, Sundstroem, and Stuxberg took leave of the expedition four days afterwards. They will return to Sweden *viâ* Siberia.

THE following pretty optical experiment is sent us by Prof. F. E. Nipher. Observe a white cloud through a plate of red glass with one eye, and through green glass with the other eye. After some moments transfer both eyes to the red glass, opening and closing each eye alternately. The strengthening of the red colour in the eye, fatigued by its complementary green, is very striking. The explanation of the phenomenon is of course well known, and many modifications of the experiment will readily suggest themselves.

IT is known to many experimenters that pulverised magnetic oxide of iron is to be preferred to iron filings in making magnetic curves. It is easily pulverised to any desired fineness. We do not know why filings are so universally recommended by writers on this subject.

THE Botanical Society of France has been recognised as an establishment of public utility by a presidential decree of Aug. 26. French botany has recently sustained a great loss in the death (at the age of seventy-two years) of M. Boreau, director of the Botanic Garden of Angers. M. Boreau was the author of a "Flora of Central France and of the Basin of the Loire," a work which has reached its third edition. Many papers by him have appeared in the *Memoirs* of the Société Académique de Maine-et-Loire.

AT the International Medical Congress at Brussels, Prof. Marey gave before a large and interested audience a simple, clear, and very complete account of the principal advances in physiology which are due to the introduction of the graphic method into its means of investigation. The application of the methods of mechanics and physics, he believes, has shown what vast horizons are open to the researches of the physiologist, by proving that now we may calculate exactly infinitely small quantities in space and time.

THE August part, just published, of the *Bulletin* of the French Geographical Society contains a very curious and interesting paper by M. E. Cortambert, on "the geographical distribution of celebrated persons in France, or the density of the intellectual forces in various parts of France." It is intended to accompany a map in which, by various tints of colour, it is attempted to indicate the proportion of notable men which have been born in the various departments of the country. M. Cortambert goes

rapidly over the various regions and departments, indicates the relative proportion of notable men belonging to each, and the particular intellectual product in which each has been most fertile. As might be expected, the north, particularly the basin of the Seine, which includes Paris, the great centre of population, is the richest. Seine-et-Oise, l'Aisne, Seine-Inférieure, Calvados, Champagne, are also marked by a deep tint. In the east, Alsace and Lorraine—which in this respect may yet be considered French—Burgundy, especially the Côte d'Or, Doubs, Lyonnais, and French-speaking Switzerland, all stand out prominent. In the south, Isère, Bouches-du-Rhône, Hérault, Haute-Garonne, Gironde, are the most remarkable. The west, as a whole, is but slightly tinted, notable exceptions being Ille-et-Villaine, Charente-Inférieure, and to some extent Maine-et-Loire and Finistère. In general, however, Brittany, whose inhabitants have many other noble qualities, does not show any great eminence from an intellectual point of view. This M. Cortambert is inclined to attribute to the fact that the Bretons are still to a large extent Celtic; and it is noteworthy that the centre of France, where also the same element is still strong, is also comparatively poor in eminent intellectual products. With regard to the particular kind of intellectual product for which each district is noted, M. Cortambert finds that the north is specially fertile in poets, claiming such names as Malherbe, Corneille, Racine, Molière, Boileau, La Fontaine, Voltaire, Beranger, De Musset; while in science it has produced such names as La Place, Élie de Beaumont, Delambre, Ducange; also not a few men eminent as painters, warriors, musicians, historians, and a large proportion of geographers. From the east come many men who have a world-wide fame in the natural, physical, and medical sciences—Buffon, Cuvier, Daubenton, Berthollet, André Ampère, Jussieu, Bichat, Récamier, Saussure, Bonnet, De Candolle, Agassiz, and others; in other departments also, specially in literature and art, this region has been fertile in great names. The south stands out prominent in the region of orators, but has also produced such men as Fermat, Legendre, Arago, Borda, Montesquieu, Montaigne, Tournefort, and Adanson. Brave sailors and celebrated voyagers are the special product of the west. In Brittany and the Centre, philosophy seems to dominate; to the latter belong Pascal and Descartes, and the daring humourist Rabelais. Altogether M. Cortambert's researches in this direction are of special interest, and will be of real value if he connects the results above indicated, as he states he intends to, with the nature of the physical and ethnographical characteristics of the various regions which he has surveyed.

We read in the Lille papers that the Catholic University of that town has been granted the use of Saint Eugenie Hospital, under certain restrictions.

The *Geological Magazine* states that Dr. W. Waagen has been appointed to the post of Palæontologist to the Indian Survey rendered vacant by the death of Dr. Stoliczka.

Scientific work will soon be resumed in Paris with activity, the Geographical, Biological, Anthropological, and other societies recommencing work within a few days. The Institute is the only French scientific institution which takes no holiday, even for any religious solemnity or national festivity. The regular weekly meetings were only interrupted *once* during the Commune, when civil war was raging in Paris. M. Élie de Beaumont, who was the perpetual secretary, tried to reach the Institute in order to open the sitting, but he was prevented by insurgents refusing to allow him to cross the barricades.

We have now the final fasciculi of a work, the publication of which has extended over the last five years, the "Nomenclator Botanicus," by Dr. L. Pfeiffer, of Cassel. In two volumes, amounting to over 3,500 pages, are here enumerated all the names and synonyms which have been applied to classes, orders, tribes, families, divisions, genera, and sub-genera of plants, from the time of Linnæus or earlier to the end of the year 1858, with reference to the place of publication. The work will be indispensable to anyone compiling a monograph of a genus or order. It is intended shortly to continue the work down to the most recent times.

The intended publication is announced, by subscription, of a "Flora of Clackmannan," by Messrs. James R. and T. Drummond. Subscribers' names are to be sent to Messrs. Maclachlan and Stewart, Edinburgh.

The Report of the Curators of the Botanical Exchange Club (Dr. J. T. Boswell and Mr. J. F. Duthie) for the last two years has just been published. It gives the new localities for scarce plants discovered during that time, and describes in great detail the observations which have been made on new forms or varieties of British plants.

The *Photographic News*, in speaking of "Photography and the Illustrated Press," gives some examples of the extent to which the latter is now dependent on the photographic art. The *New York Daily Graphic*, besides often executing its pictures from photographs, employs a photo-mechanical process in the production of some of its work. At the office of the *Moniteur Universel*, which is one of the most extensive printing and publishing establishments in France, arrangements are being made for large photo-printing works, as well as for producing coloured pictures by M. Leon Vidal's photo-chromic process. In this country photography is used to aid the artist in sketching to a great extent. One of these days, no doubt, the *News* believes, we shall have our papers illustrated by photographs *pur et simple*, but even now photography has far more to do with the execution of the illustrations in our journals than most people may be aware of.

"We were witness,' says the *Photographic News*, "the other day of a very pretty application of light made by a gardener. Everybody knows that the ripening and colouring of fruit are due for the most part to light and heat, and that the roses upon an apple are influenced by the manner in which the sun strikes it. On looking at some fine wall-fruit in a Kentish garden, the proprietor called our attention to the manner in which he allowed his peaches to be partially covered by a leaf or two, in places—namely, where he wished them to remain green—and thus heighten by contrast the purple bloom on other portions of the fruit. There were many examples of a leaf being very sharply photographed upon the fruit, and the grower, by exercising a little care during the ripening season, thus enhanced the beauty of his fruit, and also their value, as in the case of a peach it is not only its flavour, but its appearance, which governs the price at Covent Garden."

A correspondent writes as follows to the *Derry Sentinel*:—"On Sunday evening last, while going into the country, I observed at Churchill, Glendermott, a bird which at first sight I could not easily class among any known species. On coming closer, however, I found that it was a white swallow. There was no perceptible difference between it and the common swallow, with the exception of its plumage being of the purest white. Other swallows were flying about at the same time, but this *rara avis* shunned their company, and did not seem anxious to join them, as it flitted about by its solitary self, and kept at a respectful distance from the others. As I have never heard of a white swallow having been seen about this part of the country before, I consider it to be a very strange visitor."

Prof. E. Morren, of Brussels, has been making some experiments with insectivorous plants, with the result that he combats the view that they possess the power of absorbing and assimi-

lating animal matter, as stated by many observers in this and other countries. He says that so far as *Pinguicula longifolia* and *Drosera rotundifolia* are concerned, at least, he believes that the glutinous excretions of their leaves simply hasten decomposition, which is moreover attended by the usual concomitant phenomena. In very early stages he found monads, bacteria, the mycelium of various fungi, and other conditions of putrefaction. So far as the action of the mucus on the entrapped insects and on coagulated albumen is concerned, he affirms that it is similar to that of pure water, sugar-water, and the honey-secretions taken from the flowers of *Aechmea nudiflora*. Nevertheless he admits having seen all the admirable contrivances for catching and retaining insects.

MR. G. M. DAWSON, F.G.S., has just issued a report to the Canadian Government, on the geology and resources of the region in the forty-ninth parallel, between the Lake of the Woods, S.E. of Lake Winnipeg, and the Rocky Mountains; in other words, of the western portion of the boundary of British America. Much of the country traversed had been previously quite unknown, geographically as well as geologically, which fact adds greatly to the importance of the report, the bulk of which is devoted to the account of the Cretaceous and Tertiary strata of the plains between the Rocky Mountains, as they are constituted at the boundary, and the Lake of the Woods. The Survey of the United States Government to the south of the above-mentioned region, when taken in conjunction with that under notice, forms a vast addition to geologic knowledge. Among the most important results arrived at is the discovery of beds which seem to gap over the apparently considerable interval between the Cretaceous and lower Tertiary periods.

THE following interesting statistics on the libraries of Europe are taken from M. Block's recently published "Statistique de la France comparée avec les divers pays de l'Europe":—Paris has six great libraries belonging to the State and open to the public. Outside Paris there are in France 338 libraries which possess more than 3½ million volumes; of this number 41 are open in the evening. Great Britain possesses 1,771,493 volumes, or six vols. to each 100 persons of the population (this must surely refer solely to the British Museum library). Italy has 11·7 volumes per 100 inhabitants. In France there are 4,389,000 volumes, or 11·7 per 100 persons; in Austria, 2,488,000 vols. or 6·9 per 100; in Russia, 852,000 vols., or 1·3 per 100; in Belgium, 509,100 vols., or 10·4 per 100. Of all countries, France possesses the greatest number of volumes, and Paris alone has one-third of them in its libraries. Since 1865 students' libraries have been formed over nearly the whole of France. Since that year these libraries have increased from 4,833, containing 180,854 volumes, to (in 1870–1) 13,638, containing 1,158,742 volumes.

THE additions to the Zoological Society's Gardens during the past week include four Tigers (*Felis tigris*) from India, presented by H.E. the Governor-General of India; an Ocelot (*Felis pardalis*) from South America, presented by Mr. H. Kirtley; a Golden Agouti (*Dasyprocta aguti*) from South America, presented by Mr. Henry T. Balfour; a Cuvier's Toucan (*Ramphastos cuvieri*) from Upper Amazons, presented by Mr. A. Blumenthal; a Chilian Sea Eagle (*Geranoaëtus aguia*) from Paraguay, presented by Mr. E. Nelson; two Red and Yellow Mac aws (*Ara chloroptera*) from South America, presented by the Misses Rix; three Tigers (*Felis tigris*), a Leopard (*Felis pardus*), a Caracal (*Felis caracal*), two Musanga Paradoxures (*Paradoxurus musanga*) from India, a Black Lemur (*Lemur macaco*) from Madagascar, a Crab-eating Opossum (*Didelphys cancrivora*) from Central America, two Mexican Deer (*Cervus mexicanus*), deposited; a Great-billed Parrakeet (*Tanygnathus megalorhynchus*) from Gilolo, received in exchange; an American Darter (*Plotus anhinga*) from South America, purchased.

*SOME LECTURE NOTES ON METEORITES**

II.

WE may next turn our attention to the nature of the substances which fall on these occasions, and in the first place it may be briefly stated that they are of three kinds: first, masses of iron, alloyed with nickel, termed aërosiderites, or briefly siderites; secondly, stony meteorites (aërolites), which consist of silicates somewhat analogous to terrestrial rocks, but having nickeliferous iron disseminated in small granules throughout them: and finally, there is a sort of meteorite which is intermediate between these iron and stone masses, consisting of a sponge-like mass of the iron, containing in its hollows stony matter similar to that of the aërolites. These are what are termed siderolites (or meso-siderites). These different kinds of meteorites—namely, siderites, siderolites, and aërolites—then, comprehend all the forms of matter, as at present known, which fall to the earth from the regions external to its atmosphere.

Of these different kinds of meteorites, national as well as private collections have been formed in most countries in Europe. The most celebrated and historical collection of them is that at Vienna, formed by the gradual and generally contemporary acquisition of specimens of the meteorites as they have fallen or been found from time to time, from the early years of this century, and descriptions of them have been given by very eminent Viennese mineralogists. Then we have in the British Museum a not less complete collection, numbering now about 294 different meteorites. Next to these in completeness is the collection at Berlin, founded on that formed by Chladni.

The importance of the study of such collections of meteorites becomes evident, if we consider a remark of Humboldt's, in the latter part of his "Cosmos," to the effect that there are only two avenues to our knowledge of the universe outside of us, one being light, by the agency of which the motions of the heavenly bodies are revealed to us, while the other consists in the masses of matter that come to our earth from that outer universe; and that these are the only means by which we are able to take any cognisance of what is going on in the boundless regions of space.

Since Humboldt's time, indeed, light has become a totally different instrument in our hands to what it was. No longer are the heavens for us without speech or language, for light is indeed the language of the universe, though man has only yesterday begun to interpret the voices whereby one star calleth to another star.

Our interpreter is the prism, that most subtle and sensitive implement for probing the character of the most distant matter provided only it be luminous. In Humboldt's time light merely enabled us to record and calculate the mute motions of the orbs around us. Now not only are we able so to tell their motions, but we may feel new truths "trembling along that far-reaching line" which connects our eye with a star, and take cognisance of the physical conditions and chemical composition of the matter in active change upon the surface of that star. And this altogether new source of knowledge throws an entirely new interest around the question of the origin or sources of meteoric matter. Let us then next inquire of the meteorites themselves what they have to tell us in elucidation of these questions.

The first aspect of a meteorite is that of a fragment. One cannot look at it without saying so. But as to the question whether it came as a fragment into our atmosphere, or whether it became a fragment after it had entered it, we can at least say that its present fragmentary form is mainly due to the action of that atmosphere itself. Still, it is eminently probable, from other grounds, that meteorites encounter our earth, and probably our system, in the guise of fragments, or rather of angular and unshaped masses—chips, as it were, thrown off in the great workshop; matter flung out into space, not yet used up in the making of the worlds. It will be well first to consider what an examination of their physical characters and general internal structure will reveal to us. For the incrustation and pitted surface of aërolites already described an explanation was sought on the hypothesis of external fusion arising from the sudden development of enormous heat on the surface of a mass internally brittle and contracted, owing to its very low temperature. And among the more purely mechanical characteristics, we must not pass over the general want of compactness in meteorites. Thus, though a meteorite generally seems very compact, if it be suspended in chloride of mercury to dissolve the iron without affecting, or with only slight effect on, the other minerals in it, you

* Continued from p. 487.